

Work Order ID 59168

Thursday, May 27, 2010 12:35:21 PM



Page 1

Item ID: D350-748-101

Accept



Setup

Start



Revision ID:

Stop



Item Name: Crosstube Installation, High Fwd

Start Date: 5/27/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 6/11/2010 Req'd Qty: 1.00



Customer:

Reference:

Run

Start

Approvals: Process Plan: 

Date: 10-5-27

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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Draw Nbr

Revision Nbr

D350-748-141

Rev E

100



DC

Document Control

DOCUMENT CONTROL

0.00

Memo

0.00

Photocopy bluefile & type labels per PPPD350-748-101

CHG001

8/10/2013

110



CNC Bend 1

CNC Delta 100 Bender

BENDING MACHINE - CROSSTUBES

0.00

Memo

0.00

Bend tube as per Dwg D350-748-141 using CNC bender program D350F and Folio FT

DD

10-5-31

120



QC

Quality Control

QC15- Crosstube Dimensional Check

0.00

Memo

0.00

CP 10/06/07

W/O:		WORK ORDER CHANGES					
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
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QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
130		0.00							
	Crosstubes								
Crosstubes		0.00							
Crosstubes	Memo 1-Drill Tube as per Dwg D350-748-141 Using DT8876 A,B & C Drill Jigs, Set-up drill table as per QSI 010 2-Deburr 3-Engrave Part # and Batch # as per Dwg D350-748-141 4-Remove all marks from tube within limits of D350-748-141 5- Apply a light coat of LPS3 on the interior of tube Batch: <u>m109956</u>								
140		0.00							
	QC5- Inspect part completeness to step on W/O								
QC		0.00							
Quality Control	Memo CHECK 10 DEG HOLES WITH DT8876E (EUROCOPTER CLAMP)								

MP 10-06-02
AWM 10-6-4
CL 10/6/4 ①

1006.04

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Stop

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
150  Outsource3 Outsource process - Cad plate	Outsource process-Cadplate per QSI017 4.1.9.1 Memo Issue P/O: <u>12026</u> Stress relief at 375° for 5 hours Magnetic Particle Inspect per ASTM E1444 Cadium Plate per AMS-QQ-P-416B, Class 1, Type 2 Embrittle relief at 375° for 8 hours, Chromate Treat Possibe Supplier: Southwest United Industries Ensure Certificate of Conformity is attached	0.00 0.00							<u>CZ</u> <u>10/6/4</u> <u>①</u>
160  Packaging Packaging	Receive & Inspect for Damage & Mat'l Certs Memo Ensure certificate of conformity is attached	0.00 0.00							<u>Pc 10/4/30</u> <u>①</u>
170  QC Quality Control	QC5- Inspect part completeness to step on W/O Memo	0.00 0.00							<u>ml</u> <u>10</u> <u>07</u> <u>05</u> <u>①</u>

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Reference:

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Start



Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Stop



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code
--------------------------------	--------------------------	----------------------	---------	--------	--------------

180

0.00



SprayPaint

SprayPaint

Memo

0.00

Spray Painting

1-Prime inside crosstube as per QSI 005 4.2
2-Prime Outside of Tube as per Dart QSI 005 4.2

Accept Qty	Reject Qty	Reject Number	Insp. Stamp
---------------	---------------	------------------	----------------

ml	10	07	05 (1)
----	----	----	--------

190

0.00



QC14- Inspect Spray Paint

QC

Memo

0.00

Quality Control

Then, Wrap in plastic bag to protect from scratches

ET	10	07	08
----	----	----	----

200

0.00



Crosstubes

Crosstubes

Memo

0.00

Crosstubes

1-Install Ground wire Insert, then insert screw and washer
2-Install Abrasion strips as per Dwg D350-748-141 & QSI 035.
3-Install supports Using Dt8876 as per Dwg D350-748-141, Torque to 60-80 IN-LBS

ml	10	07	12 (1)
----	----	----	--------

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Reference:

Cust Item ID:

Customer:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____
QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Setup

Start

Stop

Run

Start

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

210

QC5- Inspect part completeness to step on W/O

0.00

QC

Memo

0.00

Quality Control

220

Pick Kit

0.00

Packaging

Memo

0.00

Packaging

230

QC4- 100% Inspect kits for completeness

0.00

QC

Memo

0.00

Quality Control

810607112

(F)

10-7-12SP

(F)

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Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Run

Start



Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
240		0.00							
	Packaging								
Packaging	Memo	0.00							
Packaging	Identify and pack for shipping as per PPP D350-748-101								
	Location: <u>1B5</u>								
	PPP Rev: <u>3</u>								
250		0.00							
	QC21 - Final Inspection - Work Order Release								
QC	Memo	0.00							
Quality Control									

10-7-13 SP

10-7-13

MF

10-7-13

W/O:		WORK ORDER CHANGES					
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Parent Item Name: Crosstube Installation, High Fwd

Comments: IPP Rev:A New Issue 06-07-05 JLM
IPP Rev:B Update qty of MS21042L5 06-09-12 KJ
IPP Rev:C Rev B 07-11-15 DD
IPP Rev D Combined manufacturing 08.04.02 EC verified by: DD

Start Date: 5/27/2010

Required Date: 6/11/2010

Start Qty: 1.00

Required Qty: 1.00

D350-748-141TRN

Manufactured No

110

Each

0.0000

1

1



Crosstube Turning Detail

ALS4-1032-225

Purchased No

200

Each

7,062.000

1

1



Insert

Location

Loc Qty

Loc Code

PK011

7062

110768

7062

AN960JD10

NAS1149D0363J

Purchased No

200

Each

0.0000

1

1



Washer

D2856-400

Manufactured No

200

f

269.1088

1.181

1.243158



Abraison Strip

Location

Loc Qty

Loc Code

ST403

269.1088

50593

62.0568

56626

207.052

D3500-1

Manufactured No

200

Each

36.0000

4

4



Saddle

Location

Loc Qty

Loc Code

ST425

36

47119

1

52326

9

55605

26

B-55298 MB 10-05-31

ml 10.07.12

ml 10.7.12

ml 10.07.12

10.7.12

4

W/O:		WORK ORDER CHANGES					
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IPP Rev:C Rev B 07-11-15 DD
IPP Rev D Combined manufacturing 08.04.02 EC verified by: DD

Start Date: 5/27/2010

Start Qty: 1.00

Required Date: 6/11/2010

Required Qty: 1.00

D3502-1



Manufactured No

200

Each

67.0000

2

2

Support

Location

ST066

47120

50287

52903

Loc Qty

67

1

38

28

Loc Code

MS21920-20



Purchased

No

200

Each

111.0000

2

2

Clamp (per MIL-DTL-8783C)

Location

LG

112307

112624

112793

114687

114779

Loc Qty

111

2

32

3

50

24

Loc Code

MS27039-1-10



Purchased

No

200

Each

150.0000

1

1

Screw

Location

ST291

112794

112940

Loc Qty

150

50

100

Loc Code

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Shop Packet Print

Page 2

m/ 10.07.12

m/ 10.07.12

m/ 10.07.12

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IPP Rev:C Rev B 07-11-15 DD
IPP Rev D Combined manufacturing 08.04.02 EC verified by: DD

Start Date: 5/27/2010

Required Date: 6/11/2010

Start Qty: 1.00

Required Qty: 1.00

AN4-41A Purchased No 220 Each 134.0000



Bolt

8 8



10-7-12 SP

Location	Loc Qty	Loc Code
ST360	134	
110731	2	
111424	26	
112082	6	
113359	100	

AN4-6A Purchased No 220 Each 926.0000



Bolt

16 16



10-7-12 SP

Location	Loc Qty	Loc Code
ST356	926	
112933	96	
113149	600	
114523	30	
114615	200	

AN5-32A Purchased No 220 Each 186.0000



Bolt

4 4



10-7-12 SP

Location	Loc Qty	Loc Code
ST340	186	
113121	36	
114056	100	
114405	50	

AN960JD416 NAS1149D0463J Purchased No 220 Each 0.0000



Washer

32 32



11/5000 10-7-12 SP

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 IPP Rev D Combined manufacturing 08.04.02 EC verified by: DD

Start Date: 5/27/2010

Required Date: 6/11/2010

Start Qty: 1.00

Required Qty: 1.00

AN960JD516

NAS1149D0563J Purchased No

220 Each 0.0000

8 8

Washer

D3501-1

Manufactured No

220 Each 479.0000

16 16

Bushing

Location

Loc Qty

Loc Code

ST066

479

45402

16

45918

159

48268

204

53779

100

MS21042L4

Purchased No

220 Each 2,605.000

24 24

Nut

Location

Loc Qty

Loc Code

ST139

2

111827

2

ST300

2603

113422

80

114523

1515

114718

1000

9063

8

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 IPP Rev D Combined manufacturing 08.04.02 EC verified by: DD

Start Qty: 1.00

Required Qty: 1.00

MS21042L5

Purchased No

220

Each

515.0000

4

4



Nut



11/48/13 10:7:12 SP

Location

Loc Qty

Loc Code

ST300

515

113523

12

113537

3

114437

100

114449

400

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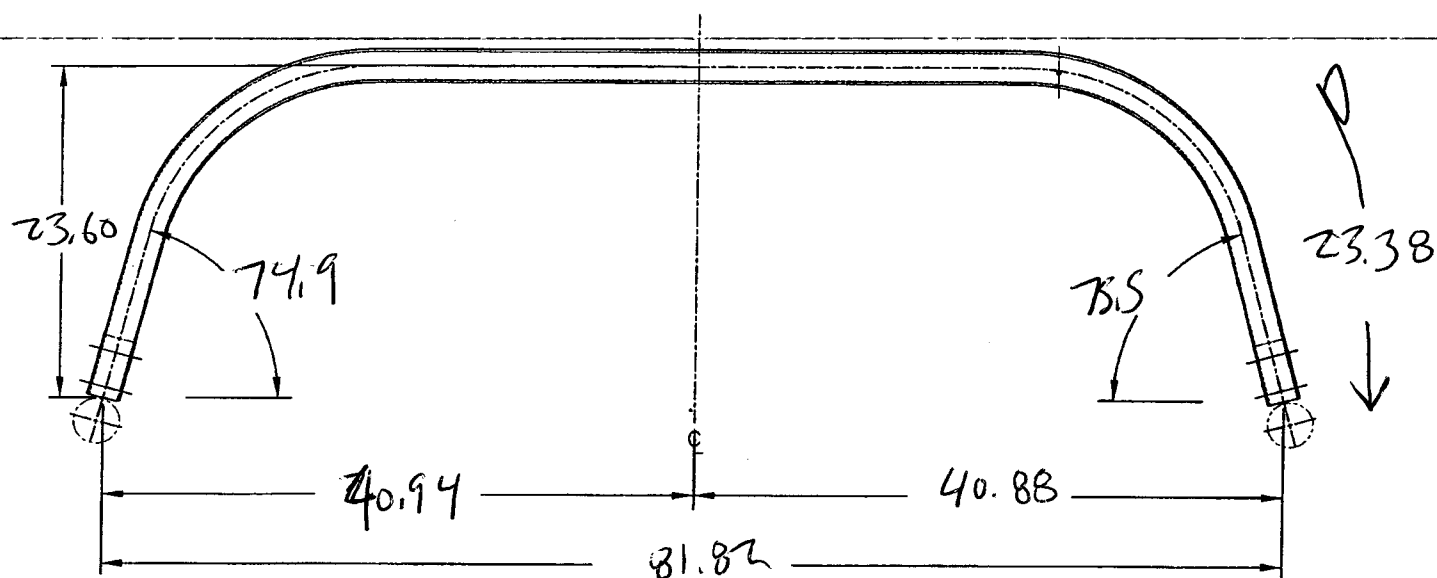
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DART AEROSPACE LTD		Work Order:	59168
Description: Crosstube High Fwd (AS350/355)		Part Number:	D350-748-101
Inspection Dwg: D350-748-141	Rev: <i>10.06.01</i>	Page 1 of 1	

Required Dimension	Min	Max
Height	23.13	23.37
1/2 Span	40.78	41.02
Angle	75	77
Total Span	81.56	82.04



Comments
Cut high side to 23.38 high
Twist 0.064

QC15 Inspection	<i>CP</i>
Date	10.06.01

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM <i>AK</i>	<i>fm</i>

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Item	Qty -141	Part Number	Description
1	X	D350-748-141	CROSSTUBE ASSEMBLY (AS 350/355 HI FWD)
2	1	D6017-115	CROSSTUBE
3	2	D3502-1	SUPPORT
4	2	D2856-400-710	ABRASION STRIP
5	1	AELS-1032-225	INSERT
6	1	NAS1149D0363J	WASHER (OR AN960JD10)
7	2	MS21920-20	CLAMP (PER DART SPEC. M-MS21920-20)
8	1	MS27039-1-10	SCREW

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6017-115
FINISHED LENGTH = 110.270±0.06
- 2) FINISH: MAGNETIC PARTICLE INSPECT PER DART QSI 038 4.2
CADMIUM PLATE PER AMS-QQ-P-418B, CLASS 1, TYPE II
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D350-748-141" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- 7) WEIGHT: 30.45 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE, EXCEPT FOR Ø0.297 HOLE.
- 9) BLEND OUT ALL EDGES FROM MACHINING LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
NOTE: ALL HOLES ARE DRILLED AFTER BENDING.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 7 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 11) HEAT TREAT TO MIN. 180 KSI PER MIL-T-6736 OR AMS 2759-1C AFTER TURNING.
- 12) INSTALL D2856-400-710 ABRASION STRIPS WITH A GAP ON BOTTOM SIDE OF CROSSTUBE, CENTERED OPPOSITE D3502-1 SUPPORT, PER QSI 035.
- 13) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE. WHEN DRILLING HOLES EXTREME CARE MUST BE TAKEN AND CAREFUL DEBURRING PERFORMED TO ENSURE A CLEAN HOLE WITH NO CRACKING/CHIPPING/GROOVES.
- 14) TORQUE CLAMPS 60 TO 80 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 5914E
10-5-27

RELEASED
2009-10-29

E	REVISE GENERAL NOTES; UPDATE TO CURRENT ADD STANDARDS; RELOCATED FLAG #6 PER PAR 08-046 (ZN A6-3); TOLERANCES (ZN C6-3, D1-3)	RF	09.09.30
D	MAG. PARTICLE AND CAD PLATE AS MFD.	CP	06.10.31
C	ADD CAD PLATING	CP	06.08.14
B	ADD D6017-115 & PRIME AND PAINT	CP	06.06.30
A	NEW ISSUE	CP	06.03.31
REV.	DESCRIPTION	BY	DATE
DESIGN	<u>RF</u>	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	<u>RF</u>	DRAWING NO.	REV. E
MFG. APPR.	<u>RF</u>	D350-748-141	SHEET 1 OF 4
APPROVED	<u>RF</u>	TITLE	SCALE
DE APPR.	<u>RF</u>	CROSSTUBE (AS 350/355 HI FWD)	NTS
DATE	09.09.30	COPYRIGHT © 2006 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

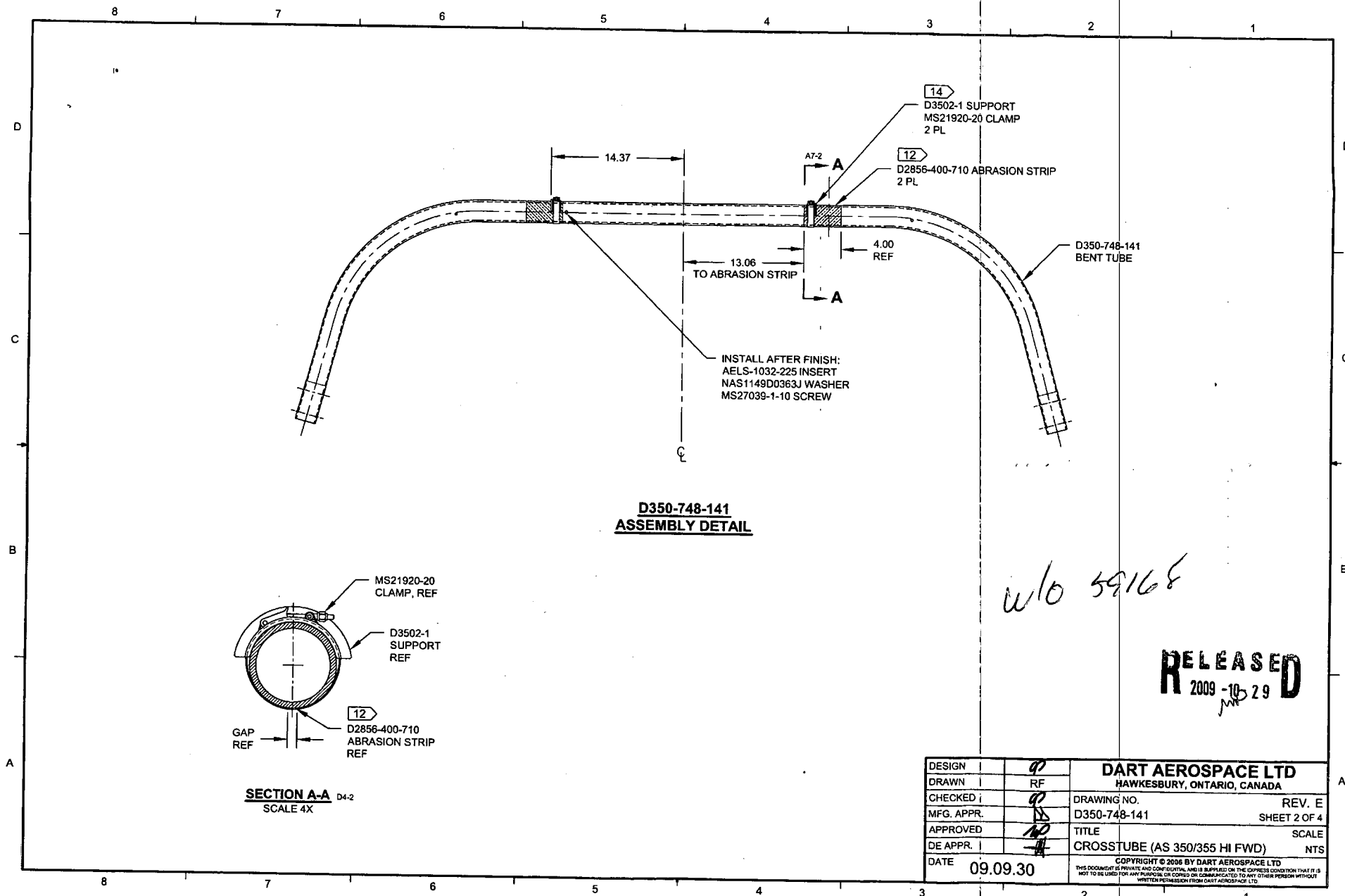
W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



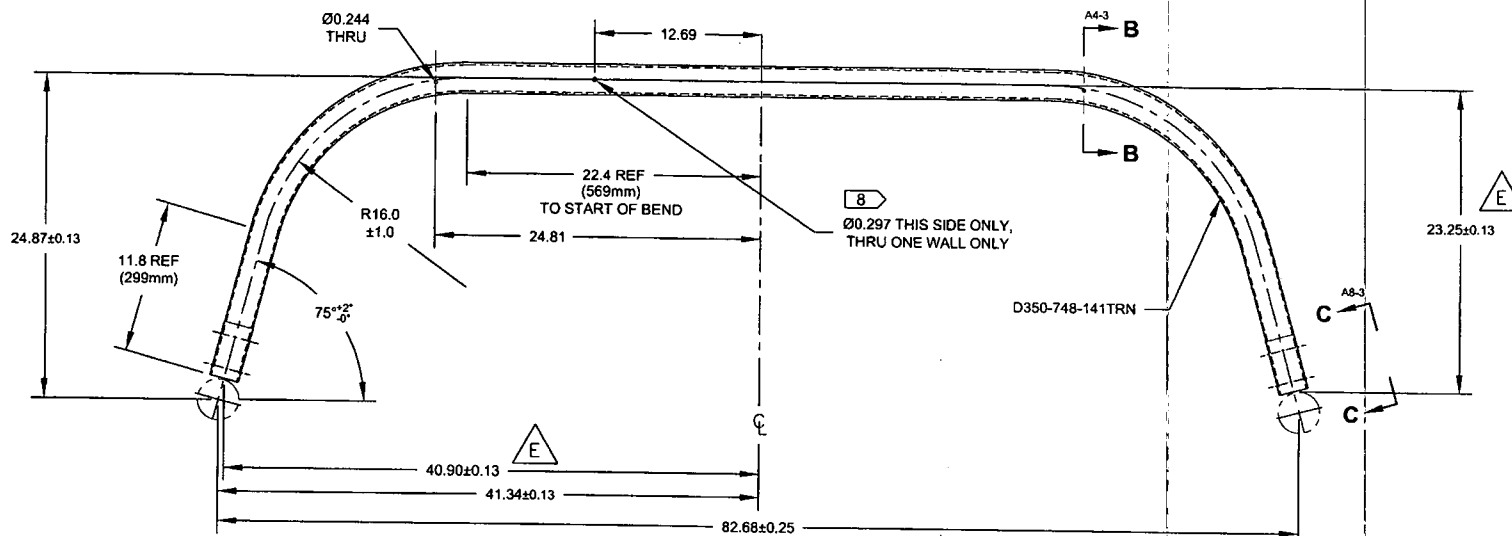
W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

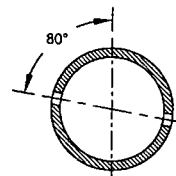
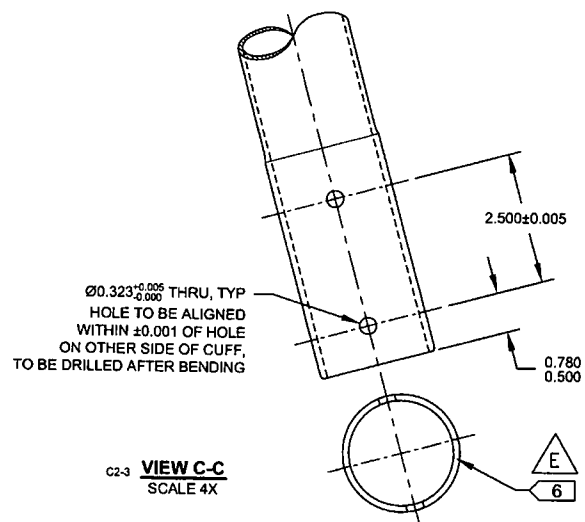
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



D350-748-141
BENDING AND DRILLING DETAIL 10



SECTION B-B D3-3
SCALE 4X

w/b 39168

RELEASED
2009-10-29
MD

DESIGN	97	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	97	DRAWING NO.	REV. E
MFG. APPR.	97	D350-748-141	SHEET 3 OF 4
APPROVED	97	TITLE	SCALE
DE APPR.	97	CROSSTUBE (AS 350/355 HI FWD)	NTS
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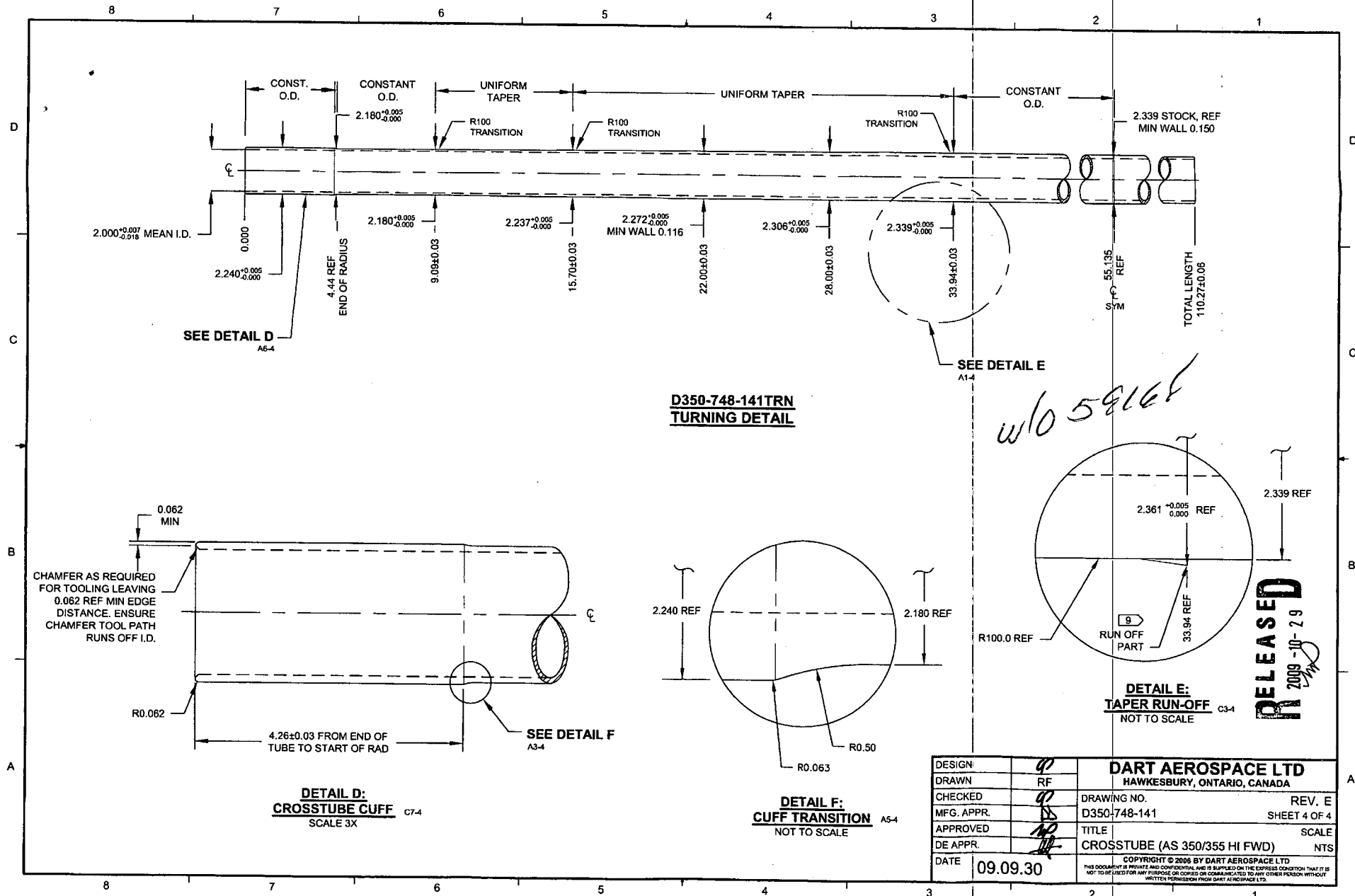
W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

**CERTIFICATE OF
CONFORMANCE**

**CADORATH PLATING CO. LTD.
2150 LOGAN AVENUE
WINNIPEG, MANITOBA R2J-0J1**

DATE: Jun-24-2010

CONSIGNEE TO: Dart Aerospace Ltd.
1270 Aberdeen St.
Hawksbury, ON K6A 1K7

W/O #: 96130

INVOICE #: 50108

**CONTRACT OR
PURCHASE ORDER #** **PO12026**

DESCRIPTION: SKID

QTY 1

P/N # d350-748-101

S/N # b59168

**CADMIUM PLATED IAW AMS-QQ-P-416B, TYPE 2 YELLOW, CLASS
1. BAKE HEAT CHART #10-634 & #10-649.**

10 07 07

**CERTIFICATE: I certify that the items indicated here on have
been inspected and tested and conform to all specifications
and requirements detailed on the contract or purchase order.**

Approved Inspector:



A large, stylized handwritten signature in black ink.

Work Order ID 59168

Thursday, May 27, 2010 12:35:21 PM



Page 1

Item ID: D350-748-101

Revision ID:

Accept



Setup Start



Item Name: Crosstube Installation, High Fwd

Start Date: 5/27/2010 Start Qty: 1.00

Stop



Required Date: 6/11/2010 Req'd Qty: 1.00

Cust Item ID:

Customer:

Reference:



Approvals:

Process Plan:

Date: 10-5-27

Tooling:

Date:

QC:

Date:

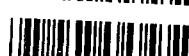
SPC (Y/N):

Date:

Run Start



Stop



Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

Draw Nbr

Revision Nbr

D350-748-141

Rev E

100



DC

Document Control

DOCUMENT CONTROL ..

0.00

Memo

0.00

Photocopy bluefile & type labels per PPPD350-748-101

CHG001

REFERENCE ONLY

110



CNC Bend I

CNC Delta 100 Bender

BENDING MACHINE - CROSSTUBES

0.00

Memo

0.00

Bend tube as per Dwg D350-748-141 using CNC bender program D350F and Folio FT

DP

10-5-31

120



QC

Quality Control

QC15- Crosstube Dimensional Check

0.00

Memo

0.00

UP 10-5-07

H:\FORMS\Quality Assurance